

## On the centipedes (Chilopoda) of the Republic of Macedonia

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### Introduction

The Republic of Macedonia (Macedonia) is situated in the South Balkans, covering a territory of 25,713 sq. km. About eighty per cent of the country is occupied by mountains and hills. The altitude averages 829 m a.s.l. Sixteen mountains are higher than 2,000 m of which Korab Mts. (2,764 or 2,864 m) is the highest one. The climate is temperate - continental in the north and in the mountains and sub-mediterranean in the south and the lowlands. The vegetation in the lowlands and at low altitude in the mountains is dominated by xerotherm forests of *Carpinus orientalis* and *Quercus coccifera* mixed with different shrubs. The middle parts of the mountains (600-1,500 m) are covered by beech and deciduous oak forests and above that belt the zone of coniferous forests begins. The orophyte treeless zone begins at an altitude of about 1,900 m.

The information on the centipedes of Macedonia is scattered among the works of ATTEMS (1903, 1929), VERHOEFF (1934, 1937a, b, 1938, 1943), MATIC & DARABANTU (1968) and MATIC (1979). All records have recently been summarized by KOS (1992) and STOEV (1997).

The present work is devoted to the treatment of a collection of centipedes gathered by Bulgarian and Macedonian zoologists from different parts of Macedonia. Twenty three morphospecies were identified, eight of which appeared new to the fauna of Macedonia. These are: *Lithobius nigripalpis*, *L. crassipes*, *L. microps* Meinert nec Auctorum, *Cryptops hortensis*, *Clinopodes polytrichus*, *Strigamia crassipes*, *S. engadina* and *S. transsilvanica*. An annotated list of the centipedes of Macedonia and adjacent lands was prepared in order to facilitate further researchers interested in the Macedonian myriapod fauna. The chorotypes of known species were defined and a preliminary zoogeographical analysis of the fauna was made.

### Material and methods

Most of the materials have been collected by G. Blagoev, V. Sakalian (Institute of Zoology, Sofia) and A. Lapeva (University of Sofia, Faculty of Biology) within

the framework of the Bulgarian-Macedonian expeditions to the Shar planina Mountains. The rest of the examined material comes from the author's trips together with D. Zaprianova (mainly the region of Ohrid and Ohridsko Lake) in 1993 and from the Pensoft Publishers expedition to Macedonia and Albania in 1995 (S. Golovatch, L. Penev, B. Petrov and P. Stoev). G. Blagoev together with C. Deltshev has contributed also with a small collection of centipedes which was sampled from different regions in the country. And last but not least a small collection was given to me by B. Guéorguiev (National Museum of Natural History-Sofia) and Dana Vidinčeva (Assistant at the Faculty of Natural History and Mathematics at Skopje University).

I am obliged to all colleagues who loaned me materials for study and especially to G. Blagoev.

Almost all samples have been gathered by hand sampling under stones, barks, and leaf litter. Only few specimens have been trapped with the aid of pitfall traps and a Winkler apparatus. All centipedes are preserved in 70 % ethanol. Species determination was made with the aid of a MBC-10 stereoscope used more often on magnification 7x and 4x. Damaged and/or juvenile specimens which are not reliably determinable are excluded from the work. All centipedes are now preserved in the Department of Non-Insect Invertebrates of the National Museum of Natural History in Sofia. Most of the chorotypes of the species have been defined according to VIGNA TAGLIANTI et al. (1999).

## Species list

### LITHOBIOMORPHA

#### Lithobiidae Newport, 1844

##### *Lithobius* (s.s.) *forficatus* (Linnaeus, 1758)

**Literature records:** Macedonia (KOS, 1992; STOEY, 1997).

**Material examined:** **Maleshevski Planini Mts.** 1 ad. fm., Bela Voda, 1,100 m a.s.l., 02.06.2000, C. Deltshev & G. Blagoev leg. **Osogovo Mts.** 2 ad. fms., 1 ad. m., above St. Joakim Osogovski Monastery, 01.06.2000, C. Deltshev & G. Blagoev leg.; 1 ad. m., near Sasa River, 01.06.2000, C. Deltshev & G. Blagoev leg. **Shar planina Mts.** 1 ad. fm., Popova shapka, 1,550 m a.s.l., 07.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 m., 1 fm., Jelak Chalet, 1,850 m a.s.l., traps, meadow, 07.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 4 ms., 1 fm., Jelak Chalet, 1,850 m a.s.l., 08.07.1995 V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 m., 2 fms., Titov Peak, 2,747 m a.s.l., 17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; numerous specimens of both sexes, Ceripashina, 2,100-2,440 m a.s.l., 09.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 4 ms., 1 ad. fm., Ceripashina, 1,600-1,800 m a.s.l., 12.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. m., Winipek, 1,550 m a.s.l., 18.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 2 ms., 2 fms., between Jelak Chalet and Ceripashina, 1,850-2,530 m a.s.l., 9-20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 m., 1 fm., near Leshnitsa Chalet, 1,480 m a.s.l., 16.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; numerous specimens of

both sexes, between Jelak Chalet and Stoudena River, 1,730-1,850 m a.s.l., 10.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. m., 1 ad. fm., Ljuboten, Erezova rupa, 1,650 m a.s.l., 10.07.1997, A. Lapeva leg.

**General distribution.** North Africa, Europe, Turkey, Caucasus. Introduced in Island, North and South America, Saint Helena Island, Hawaii.

**Chorotype.** European.

**Remarks.** Although this species has been reported to exist Macedonia by Kos (1992), these are the first exact records from the country.

***Lithobius (s.s.) muticus* C.L. Koch, 1847**

**Literature records:** Neres and Treska bei Üsküb (= Skopje) (ATTEMS, 1929).

**Material examined:** **Galichitza Mts.** several males and females, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Katlanovsko Burdo** 2 ad. ms., 3 ad. fms., 2 subad. ms., 1 subad. fm., under stones, barks, leaf litter, 02.06.2000, C. Deltshev & G. Blagoev leg. **Maleshevski Planini Mts.** 1 ad. fm., 1 subad. fm., near Berovsko Lake, leaf litter, 02.06.2000, C. Deltshev & G. Blagoev leg. **Shar planina Mts.** 1 m., Popova shapka, 1,550 m a.s.l., 07.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg. **Vodno Mt.** 1 ad. m., Skopje District, 650 m a.s.l., 03.06.2000, C. Deltshev & G. Blagoev leg.; 1 ad. m., 1 ad. fm., same locality, 700-750 m a.s.l., leaf litter, C. Deltshev & G. Blagoev leg.

**General distribution.** Ukraine, England, the Netherlands, Germany, Poland, ex-Czechoslovakia, Hungary, Romania, France, Switzerland, Italy, Austria, Slovenia, Croatia, Montenegro, Bosnia, Serbia, Albania, Republic of Macedonia, Bulgaria, Greece and Crete.

**Chorotype.** Central European.

***Lithobius (s.s.) nigripalpis* L. Koch, 1867**

**Material examined.** **Shar planina Mts.** 1 ad. m., 3 ad. fms., several juveniles, between Leshnitsa Chalet and Krivosijaska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Romania, Serbia, Republic of Macedonia, Bulgaria, Continental and Insular Greece, Crete and Turkey.

**Chorotype.** E-Mediterranean.

**Remarks.** An adult male from the following locality: Shar planina Mts., Jelak Chalet, 1,850 m a.s.l. collected on 08.07.1995 by V. Sakalian, G. Blagoev & A. Lapeva probably also belongs here. All examined specimens are with very tight and ellipsoid coxal pores in number 5-7 in the males and 7-10 in the adult females. That character plus some further differences in the antennal number, the body shape and the color of the animal speak of probably a new subspecies or geographical race of *nigripalpis*. Despite that, the large body with more than 40 antennal articles, 9, 11, 13 tergites having a distinct projection, 15<sup>th</sup> pairs of legs having a secondary claw and female gonopods constituted of two long and sharp spurs and a single claw are characters found in *nigripalpis* only and I prefer to leave the question open for the future when more material becomes available. This population forms the northwestern border of the species' range in Europe. A new species to the centipede fauna of Macedonia.



***Lithobius* (s.s.) *peregrinus* Latzel, 1880**

**Literature records:** Neres, Treska bei Üsküb (ATTEMS, 1929; ZAPPAROLI, 1992) (both records sub *L. romanus*); Karatas (ZAPPAROLI, 1992).

**Material examined:** **Shar planina Mts.** 1 ad. m., Shipkovitza, 1,600-1,850 m a.s.l., 13.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 fm., Winipek, 1,550 m a.s.l., 18.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. fm., Ceripashina, 2,100-2,440 m a.s.l., 09.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 m., 1 fm., near Leshnitsa Chalet, 1,480 m a.s.l., 16.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 2 ms., 1 fm., Leshnitsa Chalet, Vodopadite, 1,490 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 4 ad. ms., 1 subad. m., 1 ad. fm., between Leshnitsa Chalet and Krivoshijska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1m., 1 fm., between Jelak Chalet and Stoudena River, 1,730-1,850 m a.s.l., 10.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 3 ms., 1 fm., 1 juv., between Leshnitsa Chalet and Jelak Chalet, 1,480-1,850 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. m., Jelak Chalet, 1,850 m a.s.l., 08.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. fm., Ljuboten, 1,600-1,700 m a.s.l., 19.07.1997, A. Lapeva leg.; 1 ad. fm., Ljuboten, Erezova rupa, 1,650 m a.s.l., 10.07.1997, A. Lapeva leg.; 2 ad. fms., 1 ad. m., near Bistritza River, 1,200-1,600 m a.s.l., 17.08.1996, A. Lapeva leg.

**General distribution.** SE Italy, Bosnia, Montenegro, Republic of Macedonia, Serbia (Kosovo), Albania, Greece, Bulgaria, Caucasus. Introduced in England, France, Spain, NW Italy, Croatia, Ionian Islands, South Africa, Bermudes, Panama.

**Chorotype.** E-Mediterranean.

**Remarks.** This species has long been known to exist in the Shar planina Mts. The present localities only confirm the oldest records at Ljuboten and add several new. It is fairly common in the mountain and may be expected in other regions of Macedonia, too.

***Lithobius* (*Monotarsobius*) *crassipes* L. Koch, 1862**

**Material examined:** **Galichitza Mts.** 1 ad. fm., near Ohridsko Lake, 7 km South of Ohrid, 700 m a.s.l., shrubs, under stones, 07.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.

**General distribution.** Scandinavia, Ireland, England, the Netherlands, Germany, ex-Czechoslovakia, Romania, Bulgaria, Russia, Tunisia, Algeria, Iberian Peninsula, France, Switzerland, Italy, Austria, Slovenia, Croatia, Bosnia, Republic of Macedonia, Montenegro, Serbia, Albania, Greece, Turkey, Syria, Jordan, Central Asia.

**Chorotype.** Sibero-European.

**Remarks.** A new species to the Macedonian centipede fauna.

***Lithobius* (*Sigibius*) *microps* Meinert, 1868**

**Material examined:** **Galichitza Mts.** several males and females, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.; **Shar planina Mts.** several males and females, Ljuboten, 1,600 m a.s.l., *Fagetum*, 15.07.1997, A. Lapeva leg.

**General distribution.** Scandinavia, England, Ireland, Belgium, the Netherlands, France, Germany, Switzerland, North Africa, Turkey, Iberian Peninsula, Italy, Bulgaria, Republic of Macedonia, Romania, Greece, Ukraine, Introduced in the New World.

**Chorotype.** European.

**Remarks.** A new species to the Macedonian centipede fauna.

***Harpolithobius anodus* (Latzel, 1880)**

**Literature records:** Neres bei Üsküb (ATTEMS, 1929).

**Material examined:** **Shar planina Mts.** 1 ad. fm., between Leshnitsa Chalet and Krivosijaska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. fm., Leshnitsa Chalet, 1,480 m a.s.l., 17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 ad. fem., between Leshnitsa Chalet and Jelak Chalet, 1,480-1,850 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Poland, Ukraine, Romania, Italy, Austria, ex-Czechoslovakia, Hungary, Slovenia, Croatia, Bosnia, Montenegro, Albania, Republic of Macedonia, Bulgaria, Greece and Turkey.

**Chorotype.** S-European.

**Remarks.** Two males collected between Jelak Chalet and Ceripashina, 1,850-2,530 m a.s.l., 09.07.1995 by V. Sakalian, G. Blagoev & A. Lapeva probably belong to this species too.

***Harpolithobius* sp.**

**Material examined:** **Shar planina Mts.** 1 ad. fm., near Emetritza River, 1,170 m a.s.l., *Fagus* sp., traps, 18-23.07.1996, V. Sakalian, G. Blagoev & A. Lapeva leg.

**Remarks.** This single specimen is quite distinct from *H. anodus* and may be identical with *Harpolithobius ljubetensis* Verhoeff, 1934. The lack of enough specimens does not allow me to make more precise determination.

***Pleuroolithobius patriarchalis* (Berlese, 1894)**

**Literature records:** Neres bei Üsküb (ATTEMS, 1929); Nerez, Gornya Voda, Korab Gebirge, Crni Kamen, Jablanice (ZAPPAROLI & MINELLI, 1993).

**Material examined:** **Galichitza Mts.** several males and females, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.; **Ohrid District** 1 ad. m., town of Ohrid, ruins, shrubs, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.

**General distribution.** South Italy, Montenegro, Albania, Republic of Macedonia, South Bulgaria, Greece, Libya and West Anatolia.

**Chorotype.** E-Mediterranean.

**Remarks.** Although ZAPPAROLI & MINELLI (1993) reported *P. patriarchalis* from the aforementioned localities in Albania, I suppose that they in fact come from the territory of Macedonia.

***Eupolybothrus* (*Schizopolybothrus*) *caesar* (Verhoeff, 1899)**

**Syn?** *Polybothrus acherontis wardaranus* Verhoeff, 1937 Locus typus: "Treskaschlucht bei Skopje".

**Material examined:** Galichitza Mts. 1 ad. m., 1 ad. fm., Barakite County, 1,500-1,600 m a.s.l., *Fagus* sp., 19.06.1994, B. Guéorguiev leg.; 1 ad. m., near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.; **Ohrid District** town of Ohrid, 06.05.1995, under stones, S. Golovatch, B. Petrov & P. Stoev leg. **Shar planina Mts.** 1 ad. fm., near Emetritza River, 1,170 m a.s.l., *Fagus* sp., traps, 18-23.07.1996, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Bosnia, Albania, Greece and the Republic of Macedonia.

**Chorotype.** W-Balkan.

**Remarks.** The *caesar* group of *Eupolybothrus* involves several poorly-known taxa such as: *E. spiniger* (Latzel, 1888), *E. acherontis* (Verhoeff, 1900), *E. acherontis wardaranus* (Verhoeff, 1937) and *E. caesar valonensis* (Verhoeff, 1905). The latter is nothing but a junior synonym of *caesar* (STOEY, 1997, STOEY, 2001). The Latzel's description of *spiniger* from Bosnia is almost indistinguishable from that of *caesar* and being described earlier, in case of synonymisation, it will have a priority. *E. acherontis* and *E. acherontis wardaranus* seem identical with *spiniger* and *caesar* and probably are nothing but junior synonymes. Although it is not the aim of this paper to revise the *caesar* group of *Eupolybothrus*, I would like to emphasize on the close resemblance between the already described taxa and the possible priority of *spiniger* over *caesar*. A type examination is highly needed for resolving the problem. Another poorly known species of *Schizopolybothrus* - *E. stygis* (Folkmanova, 1940) seems identical with *E. leostygis* (Verhoeff, 1899). It has been described from Ilijna pechina near Trebinje, a karstic region where *leostygis* is also known to exist.

### *Eupolybothrus grossipes* (C.L. Koch, 1847) group

**Material examined:** Shar planina Mts. 1 fm., near Leshnitsa Chalet and Krivoshijska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**Remarks.** This single female very much resembles *E. grossipes*, but without enough specimens at disposal, it could not be reliably determined.

### *Eupolybothrus* sp.

**Material examined:** Kitka Mt. 1 fm, near Preslap, 900-1,000 m.a.s.l., 24.06.1994, B. Guéorguiev leg.

**Remarks.** With last pair of legs missing, the proper identification of this mutilated female was impossible.

## SCOLOPENDROMORPHA Scolopendridae Newport, 1844

### *Scolopendra cingulata* Latreille, 1829

**Literature records:** Defile de la Babuna, Titov Veles (now Veles) (MATIC, 1979).

**Material examined:** Babuna planina Mts. 1 ad., 1 subad., region of Prisad, under stones, 13.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.



**Galichitza Mts.** 2 exmpls., near Ohridsko Lake, 7 km South of Ohrid, shrubs, under stones, 700 m a.s.l., 07.05.1995 S. Golovatch, B. Petrov & P. Stoev leg.; 1 subad. specimen, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.; 1 subad., 1 ad., Oteshevo Village, 1,000-1,100 m.a.s.l., 18.06.1994, B. Guéorguiev leg.; 1 ad., 1 subad., near Ohridsko Lake, 7 km of Ohrid, 700 m a.s.l., shrubs, under stones, S. Golovatch, B. Petrov & P. Stoev leg. **Kochani District** 1 ad., 7-8 km above Istibanja Village, 770 m a.s.l., 13.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Ohrid District** 1 subad., Ohrid, under stones, 22.05.1993, P. Stoev & D. Zaprianova leg.; 1 ad., 2 subad., near Ohridsko Lake, 6-7 km from Struga, under stones, 22-23.05.1993, P. Stoev & D. Zaprianova leg. **Vodno Mt.** 2 ad. specimens, Skopje District, 900 m a.s.l., 03.06.2000, C. Deltshv & G. Blagoev leg.

**General distribution.** Tunisia, Algeria, Morocco, Portugal, Spain, France, Italy, Slovenia, Croatia, Bosnia, Montenegro, Republic of Macedonia, Hungary, Romania, Bulgaria, Albania, Greece, Turkey, NW Iran, Syria, Lebanon, Palestine, Israel, Jordan, Egypt (Sinai), Libya, Sicily, Cyprus.

**Chorotype.** Mediterranean.

### ***Cryptops anomalans* Newport, 1844**

**Literature records:** Neres bei Üsküb (ATTEMS, 1929); Oteshevo-Asamati (MATIC & DARABANTU, 1968).

**Material examined:** **Galichitza Mts.** 1 ad., Oteshevo Village, 780 m a.s.l., 18.06.1994, B. Guéorguiev leg.; 1 ad. specimen, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.

**General distribution.** Belgium, Germany, ex-Czechoslovakia, Hungary, Switzerland, Austria, Romania, Ukraine, Tunisia, Algeria, Morocco, Spain, France, Italy, Slovenia, Croatia, Bosnia, Serbia, Republic of Macedonia, Bulgaria, Albania, Greece, Turkey. Introduced in England.

**Chorotype.** European.

### ***Cryptops hortensis* (Donovan, 1810)**

**Material examined:** **Galichitza Mt.** 2 specimens, near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Maleshevski Planini Mts.** 1 specimen, Bela Voda (Berovo-Strumitsa), 02.06.2000, C. Deltshv & G. Blagoev leg. **Sharplanina Mts.** 3 specimens, between Leshnitsa Chalet and Krivoshijska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, Leshnitsa Chalet, 1,480 m a.s.l., 07.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, same locality, 17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, Leshnitsa Chalet, Vodopadite, 1,490 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Macaronesia, Europe, Caucasus. Introduced in North America and Saint Helena Island.

**Chorotype.** Turano-European-Mediterranean.

**Remarks.** The specimen from the following locality: Osogovo Mts., Kraklya, along Kriva reka River, 670 m a.s.l., 16.06.1994, B. Guéorguiev leg.

probably belongs here. Despite the fact that *C. hortensis* is a widely spread palearctic species, introduced also in North America and Saint Helena Island, it has never been recorded in Macedonia. A new species to the Macedonian centipede fauna.

***Cryptops parisi* Brölemann, 1920**

**Material examined:** **Galichitza Mts.** 1 specimen with 21<sup>st</sup> pair of legs missing, Oteshevo Village, 1,000-1,100 m a.s.l., 18.06.1994 B. Guéorguiev leg.; 1 specimen, leaf litter, August, 1991, D. Videnčeva leg.; 1 specimen, leaf litter, April, 1996, D. Videnčeva leg. **Maleshevski Planini Mts.** 1 subad. specimen, near Berovsko Lake, leaf litter, 02.06.2000, C. Deltšev & G. Blagoev leg. **Shar planina Mts.** 3 specimens, between Leshnitsa Chalet and Krivosijaska River, 1,480-2,200 m a.s.l., 20.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, Leshnitsa Chalet, 1,480 m a.s.l., 17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 5 specimens, Leshnitsa Chalet, Vodopadite, 1,490 m a.s.l., 21.07.1995 V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, Ceripashina, 1,600-1,800 m a.s.l., 12.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 2 specimens, Winipek, 1,550 m a.s.l., 18.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 3 specimens, between Leshnitsa Chalet and Jelak Chalet, 1,480-1,850 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 2 specimens, Ljuboten, 1,600 m a.s.l., *Fagus* sp., 15.07.1997, A. Lapeva leg.

**General distribution.** France, Italy, Austria, ex-Czechoslovakia, Slovenia, Croatia, Bosnia, Montenegro, Romania, Bulgaria, Republic of Macedonia, Greece, North Turkey. Introduced in England, Scandinavia and the New World.

**Chorotype.** Central European.

**GEOPHILOMORPHA**  
**Geophilidae Leach, 1815**

***Clinopodes flavidus* C.L. Koch, 1847**

**Literature records:** Neres bei Üsküb, Treska (sub *Clinopodes flavidus escherichii*) (ATTEMS, 1929).

**Material examined:** **Galichitza Mts.** 4 specimens, Barakite County, 1,500-1,600 m a.s.l., *Fagus* sp., 19.06.1994, B. Guéorguiev leg.; 1 specimen, August, 1991, D. Videnčeva leg.; 1 m., 1 fm., near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Ohrid District** 6 specimens, town of Ohrid, ruins, shrubs, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.; 1 specimen, Kefasan Frontier Check Point, 1,230 m a.s.l., 23.05.1993, P. Stoev & D. Zaprianova leg.; **Osogovo Mts.** 1 specimen, Kraklya, along Kriva reka River, 670 m a.s.l., 16.06.1994, B. Guéorguiev leg.

**General distribution.** Poland, ex-Czechoslovakia, Austria, Italy, Slovenia, Bosnia, Montenegro, Serbia, Republic of Macedonia, Albania, Romania, Bulgaria, Greece, Turkey, Cyprus, Syria, Israel, Crimea, Caucasus and Kazakhstan?.

**Chorotype.** Turano-Europeo-Mediterranean.

**Remarks.** The genus *Clinopodes* involves several taxa poorly known in the Balkans such as: *C. skopljensis* (Verhoeff, 1938), *C. improvisus* (Verhoeff, 1943)



and *C. karamani* (Verhoeff, 1943). The status of these taxa is yet to be better studied as only type examination can resolve the problem. The juvenile specimens of *C. flavidus* are almost undistinguishable from the sibling *C. polytrichus*.

***Clinopodes polytrichus* (Attems, 1903)**

**Material examined:** **Kitka Mt.** 1 specimen, near Preslap, 900-1,000 m a.s.l., 24.06.1994, B. Guéorguiev leg.; **Shar planina Mts.** 1 specimen, Leshnitsa Chalet, 1,480 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Romania, Bulgaria, Greece, Republic of Macedonia and Albania.

**Chorotype.** Balkan.

**Remarks.** A new species to the Macedonian centipede fauna.

***Clinopodes trebevicensis* (Verhoeff, 1898)**

**Material examined:** **Shar planina Mts.** 3 specimens, Leshnitsa Chalet, 1,480 m a.s.l., 16-17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 2 specimens, one of them being appx. 32 mm long with 55 pairs of legs, between Leshnitsa Chalet and Jelak Chalet, 1,480-1,850 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** NE Italy, Romania, Slovenia, Croatia, Bosnia, Montenegro, Albania, Republic of Macedonia, Bulgaria and Greece.

**Chorotype.** Balkan.

**Remarks.** This species has already been recorded in the Kosovo section of the Shar planina Mts. (ATTEMS, 1929). Present records only extend its range in south-eastern direction.

***Pachymerium ferrugineum* (C. L. Koch, 1835)**

**Material examined:** **Galichitza Mts.** 1 specimen, length appx. 25 mm with 43 pairs of legs, Oteshevo Village, 780 m a.s.l., 18.06.1994, B. Guéorguiev leg.

**General distribution.** Macaronesia, North Africa, Europe, Turkey, Palestine, Israel, Caucasus, Turkestan, Alaska, Pribilof Island. Introduced in Japan, Hawaii, North America, Juan Fernandez Islands, Pasqua Island.

**Chorotype.** W-Palearctic.

**Dignathodontidae Cook, 1895**

***Henia illyrica* (Meinert, 1870)**

**Literature records:** "Neres, Vardartal und Treska bei Üsküb" (ATTEMS, 1929); "Insel in Presba-See" (sub *Henia illyrica oblonga*) (VERHOEFF, 1934).

**Material examined:** **Babuna planina Mts.** 1 fm., region of Prisad, under stones, 13.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Galichitza Mts.** 1 ad. m., length 70 mm with 93 pairs of legs, Barakite County, 1,500-1,600 m a.s.l., *Fagus* sp., 19.06.1994, B. Guéorguiev leg.; 3 fms., 1 m., near Ohridsko Lake, 3 km NE of "St. Naum" Cloister, 750 m a.s.l., leaf litter, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg. **Ohrid District** 4 fms., 2 ms., town of Ohrid, ruins, shrubs, 06.05.1995, S. Golovatch, B. Petrov & P. Stoev leg.

**General distribution.** Poland, Germany, ex-Czechoslovakia, Austria, Hungary, NE Italy, Slovenia, Croatia, Bosnia, Montenegro, Serbia, Republic of Macedonia, Albania, Greece, Bulgaria, Romania, Turkey, Caucasus.

**Chorotype.** S-European.

### **Linotaeniidae Cook, 1904**

#### ***Strigamia crassipes* (C.L. Koch, 1835)**

**Material examined:** Galichitza Mts. 1 ad. m., length appx. 40 mm with 49 pairs of legs, Barakite County, 1,500-1,600 m a.s.l., *Fagus* sp., 19.06.1994, B. Guéorguiev leg. Shar planina Mts. 1 fm., Leshnitsa Chalet, 1,480 m a.s.l., 07.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 fm., same locality, 17.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 3 specimens, same locality, 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 fm., length 40 mm with 49 pairs of legs, between Leshnitsa Chalet and Jelak Chalet, 1,480-1,850 m a.s.l., 21.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, between Jelak Chalet and Stoudena River, 1,730-1,850 m a.s.l., V. Sakalian, G. Blagoev & A. Lapeva leg.; 1 specimen, Ceripashina, 1,600 m a.s.l., 12.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**Chorotype.** European.

**General distribution.** Scandinavia, England, Ireland, Denmark, the Netherlands, Poland, Germany, Portugal, France, Italy, Austria, ex-Czechoslovakia, Hungary, Romania, Slovenia, Croatia, Bosnia, Albania, Republic of Macedonia, Bulgaria, Greece, Russia.

**Remarks.** Although *S. crassipes* has been reported to exist in the neighbouring Kosovo (ATTEMS, 1929), it is herewith recorded in Macedonia for the first time. A new species to the centipede fauna of Macedonia.

#### ***Strigamia engadina* (Verhoeff, 1935)**

**Material examined:** Shar planina Mts. 1 m., Titov Peak, 2,747 m a.s.l., 14.07.1995, V. Sakalian, G. Blagoev & A. Lapeva leg.

**General distribution.** Slovenia, Republic of Macedonia, Greece, Bulgaria, Romania, Poland, Italy and France.

**Chorotype.** Central European.

**Remarks.** A new species to the Macedonian centipede fauna.

#### ***Strigamia transsilvanica* (Verhoeff, 1928)**

**Material examined:** Maleshevski Planini Mts. 1 m., length: 16 mm with 45 pairs of legs, 1 fm., length: 16 mm with 41 pairs of legs, Bela Voda (Berovo-Strumitsa), 02.06.2000, C. Deltchev & G. Blagoev leg.

**General distribution.** Slovenia, Croatia, Bosnia, Montenegro, Albania, Republic of Macedonia, Serbia, Bulgaria, Greece, Romania. Introduced? in Japan and Taiwan.

**Chorotype.** Balkan.

**Remarks.** A new species to the Macedonian centipede fauna.

***Himantarium gabrielis* (Linnaeus, 1767)**

**Literature records:** "Neres, Gornja voda bei Üsküb" (ATTEMS, 1929).

**Material examined:** Kozhuf Mt. 1 ad. fm., 6 km above Nagorski bani, 500 m a.s.l., 27.09.1995, B. Guéorguiev leg.

**General distribution.** Tunisia, Algeria, Morocco, Spain, France, Italy, Slovenia, Croatia, Bosnia, Montenegro, Albania, Republic of Macedonia, Greece, South Romania, Bulgaria, West Turkey, Syria, Palestine. Introduced in Madagascar.

**Chorotype.** Mediterranean.

## Conclusions

The centipede fauna of Macedonia is still poorly known. By now 36 species and subspecies of centipedes have been recorded from the country. At least two other species from the *erythrocephalus* group of *Lithobius* (s.s.) were examined but not included in the current work because of the forthcoming revision of this cluster of species in the Balkans.

Several taxa have been recorded in the adjacent lands in near proximity to the border with Macedonia and will probably be discovered in the country also. These are: *Schendyla montana*, *Strigamia acuminata*, *Henia crinita*, *Lithobius castaneus*, *L. tricuspis*, *L. matici* (= *L. validus punctulatus*), *Eupolybothrus transsylvanicus* (all records from Ljuboten, Kosovian part); *L. lakatnicensis* (Osogovo Mt., Bulgaria); *Henia athenarum*, *Pleurogeophilus mediterraneus*, *Lithobius agilis*, *L. lapidicola*, *L. latro*, *L. lucifugus*, *L. viriatus*, *L. micropodus* Matic, 1980 (all from North Greece, Macedonia region).

The following species have been described from Macedonia and the neighboring countries and since their original description have never been found again. Their taxonomic status is very unclear and needs re-evaluation. These are: *Lithobius karamani* Verhoeff, 1937 (near Skopje), *L. erythrocephalus montanus* Attems, 1929 (Ljuboten, Kosovo), *L. temnensis* Verhoeff, 1943 (North Greece, Temnata Cave near Pella), *L. pussilus treskanus* (Treskaschlucht bei Skopje), *Monotarsobius auritus* Verhoeff, 1943 (North Greece, Temnata Cave near Pella), *M. microps pozarskensis* Verhoeff, 1943 (North Greece, Pozarska mala Cave near Pella), *Eupolybothrus acherontis wardaranus* (Verhoeff, 1937) (Treskaschlucht bei Skopje), *E. macedonicus* (Verhoeff, 1943) (North Greece, Temnata Cave near Pella), *E. sketi* Matic, 1979 (Cheplez, Jacupitza Mt.), *Simophilus albanensis* Attems, 1929 (Ljuboten, Kosovo) and *Clinopodes skopljensis* Verhoeff, 1938 (Skopje).

Although little is known about the centipede fauna Macedonia and the real species number could be much bigger than the presently known a brief zoogeographical analysis shows that the fauna is constituted mainly by species of a southern (S-European, Mediterranean, E-Mediterranean, Balkan, Macedonian endemics) origin. The species with northern distribution form approximately one third of the Macedonian centipede fauna. Only four



species are considered Macedonian endemics but their taxonomic status is uncertain and needs to be better studied (table 1).

Table 1  
Chorotypes of the Macedonian centipedes

Species	Chorotype
<i>Pachymerium ferrugineum</i> (C. L. Koch, 1835)	W-Palearctic
<i>Lithobius crassipes</i> L. Koch, 1862	Sibero-European
<i>Cryptops hortensis</i> (Donovan, 1810)	Turano-European-Mediterranean
<i>Clinopodes flavidus</i> C.L. Koch, 1847	Turano-European-Mediterranean
<i>Lithobius forficatus</i> (Linnaeus, 1758)	European
<i>Lithobius erythrocephalus</i> C.L. Koch, 1847	European
<i>Lithobius microps</i> Meinert, 1868	European
<i>Cryptops anomalans</i> Newport, 1844	European
<i>Strigamia crassipes</i> (C.L. Koch, 1835)	European
<i>Lithobius muticus</i> C.L. Koch, 1847	Central European
<i>Lithobius piceus</i> L. Koch, 1862	Central European
<i>Cryptops parisi</i> Brölemann, 1920	Central European
<i>Strigamia engadina</i> (Verhoeff, 1935)	Central European
<i>Harpolithobius anodus</i> (Latzel, 1880)	S-European
<i>Henia illyrica</i> (Meinert, 1870)	S-European
<i>Scutigera coleoptrata</i> (Linnaeus, 1758)	Mediterranean
<i>Scolopendra cingulata</i> Latreille, 1829	Mediterranean
<i>Geophilus linearis</i> C.L. Koch, 1835	Mediterranean
<i>Himantarium gabrielis</i> (Linnaeus, 1767)	Mediterranean
<i>Bothriogaster signata</i> (Kessler, 1874)	Turano-Mediterranean
<i>Lithobius nigripalpis</i> L. Koch, 1867	E-Mediterranean
<i>Lithobius peregrinus</i> Latzel, 1880	E-Mediterranean
<i>Pleuroolithobius patriarchalis</i> (Berlese, 1894)	E-Mediterranean
<i>Lithobius wardaranus</i> (Verhoeff, 1937)	Balkan
<i>Lithobius trebinjanus</i> Verhoeff, 1900	Balkan
<i>Strigamia transsilvanica</i> (Verhoeff, 1928)	Balkan
<i>Clinopodes polytrichus</i> (Attems, 1903)	Balkan
<i>Clinopodes trebevicensis</i> (Verhoeff, 1898)	Balkan
<i>Eupolybothrus caesar</i> (Verhoeff, 1899)	W-Balkan
<i>Lithobius karamani</i> Verhoeff, 1937	Macedonian endemic
<i>Eupolybothrus sketi</i> Matic, 1979	Macedonian endemic
<i>Clinopodes skopljensis</i> (Verhoeff, 1938)	Macedonian endemic
<i>Insignoporus sturanyi</i> Attems, 1903	Macedonian endemic

## Annotated list of the centipedes (Chilopoda) of Macedonia

### LITHOBIOMORPHA Pocock, 1895

#### L i t h o b i i d a e Newport, 1844

##### Lithobiinae Pocock, 1901

- Lithobius erythrocephalus* C.L. Koch, 1847  
*L. forficatus* (Linnaeus, 1758)  
*L. karamani* Verhoeff, 1937  
*L. muticus* C.L. Koch, 1847  
*L. nigripalpis* L. Koch, 1867  
*L. peregrinus* Latzel, 1880  
*L. piceus* L. Koch, 1862  
*L. pusillus treskanus* Verhoeff, 1937 = ? *L. lapidicola* Meinert, 1872  
*L. (Monotarsobius) crassipes* L. Koch, 1862  
*L. (Sigibius) burzenlandicus wardaranus* (Verhoeff, 1937)  
*L. (S.) microps* Meinert, 1862 nec Auctorum  
*L. (S.) trebinjanus* Verhoeff, 1900  
*Harpolithobius anodus* (Latzel, 1880)  
*Pleuroolithobius patriarchalis* (Berlese, 1894)

##### Ethopolyinae Chamberlin, 1915

- Eupolybothrus grossipes* (C.L.Koch, 1847) group  
*E. sketi* Matic, 1979  
*E. caesar* (Verhoeff, 1899)  
= ? *E. acherontis wardaranus* (Verhoeff, 1937)

### SCUTIGEROMORPHA Pocock, 1896

#### S c u t i g e r i d a e Gervais, 1837

- Scutigera coleoptrata* (Linnaeus, 1758)

### SCOLOPENDROMORPHA Pocock, 1896

#### S c o l o p e n d r i d a e Newport, 1844

##### Scolopendrinae Newport, 1844

- Scolopendra cingulata* Latreille, 1829

##### Cryptopinae Kohlrausch, 1881

- Cryptops anomalans* Newport, 1844  
*C. hortensis* (Donovan, 1810)  
*C. parisi* Brölemann, 1920

**GEOPHILOMORPHA (Pocock, 1895)**  
**Geophilidae Leach, 1815**

*Geophilus linearis* C.L. Koch, 1835  
*Clinopodes flavidus* C.L. Koch, 1847  
*C. polytrichus* (Attems, 1903)  
*C. skopljensis* (Verhoeff, 1938)  
*C. trebevicensis* (Verhoeff, 1898)  
*Insigniporus sturanyi* Attems, 1903  
*Pachymerium ferrugineum* (C.L. Koch, 1835)

**Dignathodontidae Cook, 1895**

*Henia illyrica* (Meinert, 1870)

**Linotaeniidae Cook, 1904**

*Strigamia crassipes* (C.L. Koch, 1835)  
*S. engadina* (Verhoeff, 1935)  
*S. transsilvanica* (Verhoeff, 1928)

**Himantariidae Cook, 1895**

*Bothriogaster signata* (Kessler, 1874)  
*Himantarium gabrielis* (Linnaeus, 1767)

The following taxa have been recorded in the region of Ljuboten (Kosovo) near the border with the Republic of Macedonia: *Schendyla montana*, *Simophilus albanensis*, *Clinopodes flavidus*, *C. trebevicensis*, *Strigamia acuminata*, *S. crassipes*, *Henia crinita*, *Lithobius castaneus*, *L. forficatus*, *L. peregrinus*, *L. matici* (= *L. validus punctulatus*), *L. erythrocephalus*, *L. erythrocephalus montanus*, *L. lapidicola*, *L. tricuspis*, *L. trebinjanus*, *L. pussilus* (= ? *L. lapidicola*), *Pleurolithobius patriarchalis*, *Harpolithobius anodus*, *Harpolithobius ljubetensis*, *Eupolybothrus transsylvanicus*, *E. grossipes* group (sub *Eupolybothrus fasciatus bosniensis*).

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## Върху хилоподите (Chilopoda) на Република Македония

Павел СТОЕВ

(Р е з ю м е)

Съобщават се 23 вида хилоподи, събрани в Република Македония от български и македонски зоолози. Нови за фауната на страната са осем вида. Разглежда се валидността на групата от видове близки до *Eupolybothrus caesar* (Verhoeff, 1899) и се изказва предположение за синонимизирането на този вид, както и вероятно на *Eupolybothrus acherontis wardaranus* (Verhoeff, 1937) с *Eupolybothrus spiniger* (Latzel, 1888). Направен е пълен списък на досега известните хилоподи от Македония, както и кратък зоогеографски анализ на хилоподната фауна.